No. 8600043

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Jacob Hartz Seed Co., Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* * YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS REQUIRED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'Hartz 9190'

CORRECTED CERTIFICATE

* Date of Grant September 30, 1986

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 30th *day of* June *in the year of our Lord one thousand nine hundred and* eighty-eight.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426)

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1 NAME OF APPLICANT(S)
JACOB HARTZ SEED COMPANY, INC.

2 TEMPORARY DESIGNATION
H80-20553

3 VARIETY NAME
HARTZ 9190

4 ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
P.O. BOX 946
STUTTGART, AR 72160

5 PHONE *(Include area code)*
501-673-8565

FOR OFFICIAL USE ONLY

PVPO NUMBER
8600043

6 GENUS AND SPECIES NAME
GLYCINE MAX

7. FAMILY NAME *(Botanical)*
LEGUMINOSEA

FILING
DATE 12/26/86
TIME ☑ A.M. ☐ P.M.

8. KIND NAME
SOYBEAN

9. DATE OF DETERMINATION
1984

FEES RECEIVED
AMOUNT FOR FILING
$ 1800.00
DATE Dec. 26, 1985
AMOUNT FOR CERTIFICATE
$ 200 00
DATE August 4, 1986

10 IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
CORPORATION

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
DELAWARE

12. DATE OF INCORPORATION
1984

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
DR. CURTIS WILLIAMS
JACOB HARTZ SEED COMPANY, INC.
P.O. BOX 946
STUTTGART, AR 72160
PHONE *(Include area code)* 501-673-8565

14 CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A. Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B. Novelty Statement.
c. ☒ Exhibit C. Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☐ Exhibit D. Additional Description of Variety.
e. ☒ Exhibit E. Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☒ Yes *(If "Yes," answer items 16 and 17 below)* ☐ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ Yes ☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ Foundation ☒ Registered ☒ Certified

18 DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ Yes *(If "Yes," give date)*
☒ No

19 HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. **The applicant**(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, **and believe**(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT
Curtis Williams
DATE
Dec 20, 1985

SIGNATURE OF APPLICANT
DATE

FORM [illegible]-470 (7-84) (Edition of 3-84 is obsolete.)

1

EXHIBIT A

ORIGIN AND BREEDING HISTORY

"HARTZ 9190" was selected as a rogue in a field of Foundation "UFV-1" soybeans grown near Harlingen, Texas in 1979. Seed from the plant was grown in a single plant row at Monte Alto, Texas in 1980 and designated as H80-20553. It was yield tested in Hartz Seed Company research plots located on Rio Farms, Inc., Monte Alto, Texas from 1981-1985. A small seed increase was grown in Belize, C.A., during the winter of 1982-83 with a subsequent small increase grown on Rio Farms in 1983-1985.

Hartz 9190 was screened for reaction to the diseases bacterial pustule, phytophthora root rot, root-knot nematode and race 3 cyst nematode at Stuttgart, Arkansas by Hartz Seed Company. Protein and oil content was determined by the University of Illinois.

EVIDENCE OF STABILITY - Hartz 9190 has appeared stable and uniform through six years of testing and three years of seed increase.

KINDS OF VARIANTS - Plants with brown pubescence that have white flowers and shinny yellow seed with brown hila may occur in a frequency of ~~seeds per pound~~ 0.5% SEEDS PER POUND. RJS 6/6/88. These plants are 4 - 8 inches taller than Hartz 9190. Seed coat molting occurs but varies in intensity and frequency by years.

EXHIBIT B

NOVELTY STATEMENT

'HARTZ 9190' is most similar to "UFV-1" soybeans, but Hartz 9190 has dull seed coats with black hila, while UFV-1 has shinny seed coats with brown hila.

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (Glycine max L.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
JACOB HARTZ SEED COMPANY, INC.	H80-20553	HARTZ 9190

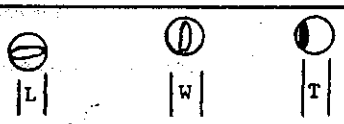
ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
P.O. BOX 946
STUTTGART, AR 72160

FOR OFFICIAL USE ONLY
PVPO NUMBER 8600043

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., [0][9]). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:

[2]



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)
2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ **2. SEED COAT COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green 3 = Brown 4 = Black 5 = Other *(Specify)* _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

[1] 1 = Dull ('Corsoy 79'; 'Braxton') 2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ **4. SEED SIZE: (Mature Seed)**

[1][5] Grams per 100 seeds

★ **5. HILUM COLOR: (Mature Seed)**

[6] 1 = Buff 2 = Yellow 3 = Brown 4 = Gray 5 = Imperfect Black 6 = Black 7 = Other *(Specify)* _____

★ **6. COTYLEDON COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green

★ **7. SEED PROTEIN PEROXIDASE ACTIVITY:**

[ ] 1 = Low 2 = High

★ **8. SEED PROTEIN ELECTROPHORETIC BAND:**

[ ] 1 = Type A ($SP1^a$) 2 = Type B ($SP1^b$)

★ **9. HYPOCOTYL COLOR:**

[3] 1 = Green only ('Evans'; 'Davis') 2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ **10. LEAFLET SHAPE:**

[3] 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other *(Specify)* _____

11. LEAFLET SIZE:

[2] 1 = Small ('Amsoy 71'; 'A5312') 2 = Medium ('Corsoy 79'; 'Gasoy 17') 3 = Large ('Crawford'; 'Tracy')

12. LEAF COLOR:

[2] 1 = Light Green ('Weber'; 'York') 2 = Medium Green ('Corsoy 79'; 'Braxton') 3 = Dark Green ('Gnome'; 'Tracy')

★ **13. FLOWER COLOR:**

[2] 1 = White 2 = Purple 3 = White with purple throat

★ **14. POD COLOR:**

[1] 1 = Tan 2 = Brown 3 = Black

★ **15. PLANT PUBESCENCE COLOR:**

[2] 1 = Gray 2 = Brown (Tawny)

16. PLANT TYPES:

[1] 1 = Slender ('Essex'; 'Amsoy 71') 2 = Intermediate ('Amcor'; 'Braxton') 3 = Bushy ('Gnome'; 'Govan')

★ **17. PLANT HABIT:**

[1] 1 = Determinate ('Gnome'; 'Braxton') 2 = Semi-Determinate ('Will') 3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ **18. MATURITY GROUP:**

[1][2] 1 = 000 2 = 00 3 = 0 4 = I 5 = II 6 = III 7 = IV 8 = V 9 = VI 10 = VII 11 = VIII 12 = IX 13 = X

★ **19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

BACTERIAL DISEASES:

★ [2] Bacterial Pustule *(Xanthomonas phaseoli* var. *sojensis)*

★ [0] Bacterial Blight *(Pseudomonas glycinea)*

★ [0] Wildfire *(Pseudomonas tabaci)*

FUNGAL DISEASES:

★ [0] Brown Spot *(Septoria glycines)*

Frogeye Leaf Spot *(Cercospora sojina)*

★ [0] Race 1 [ ] Race 2 [ ] Race 3 [ ] Race 4 [ ] Race 5 [ ] Other *(Specify)* _____

[0] Target Spot *(Corynespora cassiicola)*

[0] Downy Mildew *(Peronospora trifoliorum* var. *manshurica)*

[0] Powdery Mildew *(Microsphaera diffusa)*

★ [0] Brown Stem Rot *(Cephalosporium gregatum)*

[0] Stem Canker *(Diaporthe phaseolorum* var. *caulivora)*

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19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

★ [0] Pod and Stem Blight *(Diaporthe phaseolorum* var; *sojae)*

[0] Purple Seed Stain *(Cercospora kikuchii)*

[0] Rhizoctonia Root Rot *(Rhizoctonia solani)*

Phytophthora Rot *(Phytophthora megasperma* var. *sojae)*

★ [1] Race 1 [0] Race 2 [0] Race 3 [0] Race 4 [0] Race 5 [0] Race 6 [0] Race 7

[0] Race 8 [0] Race 9 [ ] Other *(Specify)* _____

VIRAL DISEASES:

[0] Bud Blight (Tobacco Ringspot Virus)

[0] Yellow Mosaic (Bean Yellow Mosaic Virus)

★ [0] Cowpea Mosaic (Cowpea Chlorotic Virus)

[0] Pod Mottle (Bean Pod Mottle Virus)

★ [0] Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode *(Heterodera glycines)*

★ [0] Race 1 [0] Race 2 [1] Race 3 [1] Race 4 [ ] Other *(Specify)* _____

[0] Lance Nematode *(Hoplolaimus Colombus)*

★ [1] Southern Root Knot Nematode *(Meloidogyne incognita)*

★ [0] Northern Root Knot Nematode *(Meloidogyne Hapla)*

[0] Peanut Root Knot Nematode *(Meloidogyne arenaria)*

[1] Reniform Nematode *(Rotylenchulus reniformis)*

[ ] OTHER DISEASE NOT ON FORM *(Specify):* _____

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

★ [0] Iron Chlorosis on Calcareous Soil

[ ] Other *(Specify)* _____

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

[0] Mexican Bean Beetle *(Epilachna varivestis)*

[0] Potato Leaf Hopper *(Empoasca fabae)*

[ ] Other *(Specify)* _____

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape		Seed Coat Luster	
Leaf Shape		Seed Size	
Leaf Color		Seed Shape	
Leaf Size		Seedling Pigmentation	

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS * MATURITY 2-Year	PLANT LODGING SCORE**	CM PLANT HEIGHT**	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS +	NO. SEEDS/ POD
				CM Width	CM Length	% Protein +	% Oil +		
HARTZ 9190 Submitted	128	1.3	76	-	-	44.5	20.0	14.5	MOSTLY 3
UFV-1 Name of Similar Variety	120	1.2	61	-	-	42.6	22.0	14.0	MOSTLY 3

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A_2 in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

* 1984-1985 AVERAGE
** 8 TESTS OVER 4 YEARS
\+ 3 YEAR AVERAGE 1 LOCATION

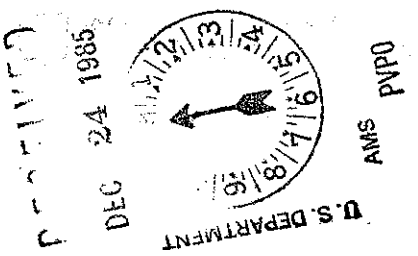

EXHIBIT D
ADDITIONAL DATA

TABLE 1: YIELD OF HARTZ 9190, UFV-1 AND JUPITER SOYBEANS IN HARTZ SEED COMPANY PLOTS ON RIO FARMS, INC., MONTE ALTO, TEXAS (1982 - 1985)

			VARIETY				
YEAR	TEST	REPLICATIONS	HARTZ 9190	UFV-1	JUPITER*	CV%	LSD .05
1985	Y4	5	39.3**	36.9**	31.0**	8.6	4.2
1984	Y4	4	32.2	22.6	25.0	15.3	7.3
1984	Y2-A	3	42.2	23.7	30.2	13.9	11.8
1984	Y2-B	3	39.0	23.5	29.6	11.8	7.6
1983	Y4	4	41.0	36.2	34.3	9.3	4.9
1983	Y1	3	29.5	27.2	27.1	11.0	4.8
1982	Y4	4	41.5	35.7	25.5	7.6	4.0

* IN 1983-84-85 JUPITER R WAS USED
** YIELD IN BUSHELS PER ACRE

TABLE 2: PLANT HEIGHT OF HARTZ 9190, UFV-1 AND JUPITER SOYBEANS IN HARTZ SEED COMPANY PLOTS ON RIO FARMS, INC., MONTE ALTO, TEXAS (1982 - 1985)

			VARIETY		
YEAR	TEST	REPLICATIONS	HARTZ 9190	UFV-1	JUPITER
1985	Y4	5	32*	27*	31*
1984	Y4	4	28	22	30
1984	Y2-A	3	34	24	35
1984	Y2-B	3	29	25	33
1983	Y4	4	28	21	28
1983	Y1	3	26	22	25
1982	Y4	4	33	30	33
AVERAGE OF ALL TESTS			30	24	31

* PLANT HEIGHT IN INCHES - AVERAGE OF REPS.

TABLE 3: LODGING HEIGHT OF HARTZ 9190, UFV-1 AND JUPITER SOYBEANS IN HARTZ SEED COMPANY PLOTS ON RIO FARMS, INC., MONTE ALTO, TEXAS (1982 - 1985)

			VARIETY		
YEAR	TEST	REPLICATIONS	HARTZ 9190	UFV-1	JUPITER
1985	Y4	5	1.9*	1.3*	1.5*
1984	Y4	4	1.1	1.1	1.6
1984	Y2-A	3	1.3	1.0	2.8
1984	Y2-B	3	1.0	1.1	2.0
1983	Y4	4	1.0	1.0	1.0
1983	Y1	3	1.0	1.0	1.0
1982	Y4	4	1.5	1.7	2.3
AVERAGE OF ALL TESTS			1.3	1.2	1.7

* LODGING AVEREAGE OF REPS 1= NO LODGING 5= ALL PLANTS DOWN

EXHIBIT E

BASIS OF APPLICANTS OWNERSHIP

Jacob Hartz Seed Company, Incorporated, Stuttgart, Arkansas established a Plant Breeding Program in 1972 for the purpose of developing, releasing, and maintaining stocks of soybean varieties developed by its Plant Breeding Program.

Dr. Curtis Williams, Plant Breeder, was licensed to breed soybeans by the Arkansas State Plant Board, December 9, 1977. Dr. Williams and co-workers developed and tested this variety in trials at Stuttgart, Arkansas, and at Edcouch, Texas.

On April 23, 1983, Jacob Hartz Seed Company, Inc., was purchased by HybriTech Seed International, Inc., a wholly owned subsidiary of Monsanto, St. Louis, Missouri. Jacob Hartz Seed Company, Inc., was originally incorporated in 1948 in the State of Arkansas. In 1984 Jacob Hartz Seed Company, Inc. merged with the Monsanto-West Africa, Inc., a Delaware Corporation. Jacob Hartz Seed Company, Inc., is the present name of the merged corporation which is a Delaware corporation.